ISSUANCE DATE AND SIGNATURE PAGE

U.S. ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT: CLASS I
Permit Number AK-1I003-A

In compliance with provisions of the Safe Drinking Water Act (SDWA), as amended, (42 U.S.C. 300f-300j-9), and attendant regulations incorporated by the U.S. Environmental Protection Agency (EPA) under Title 40 of the Code of Federal Regulations, ARCO Alaska, Inc. (permittee) is authorized to inject non-hazardous industrial waste through up to three Class I injection wells at the Alpine Field of the Colville River Unit of the North Slope of Alaska, into the Ivishak and Sag River Formations, in accordance with conditions set forth herein. Injection of hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA), as amended, (42 USC 6901) or radioactive wastes are not authorized under this permit. Injection shall not commence until the operator has received written authorization from the EPA Director, Region 10 Office of Water, to inject.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit is issued. Appendices are referenced to the Alpine Development Project Underground Injection Control Permit application dated September 1997.

This permit shall become effective on February 3, 1999, in accordance with 40 CFR 124.15.

This permit and the authorization to inject shall expire at midnight, February 3, 2009, unless terminated.

Signed this 3rd day of February, 1999

/s/ Randall F. Smith
Randall F. Smith, Director
Office of Water
U.S. Environmental Protection Agency
Region 10

This modification effective February 14th, 2000

/s/ Randall F. Smith
Randall F. Smith, Director
Office of Water
U.S. Environmental Protection Agency
Region 10

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PART I
GENERAL PERMIT CONDITIONS

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The underground injection activity, otherwise authorized by this permit, shall not allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 141 or may otherwise adversely affect the health of persons or the environment. Compliance with this permit during its term constitutes compliance for purposes of enforcement with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other law governing protection of public health or the environment from imminent and substantial endangerment to human health or the environment.

This permit may be modified, revoked and reissued, or terminated during its term for cause. Issuance of this permit does not convey property rights or mineral rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. This permit does not authorize any above ground generating, handling, storage, or treatment facilities.

This permit is based on the permit application submitted in September 1997.

B. PERMIT ACTIONS

1. Modification, Reissuance or Termination

This permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR 144.39 and 144.40. Also, the permit can undergo minor modifications for cause as specified in 40 CFR 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

2. Transfer of Permits

This permit is not transferable to any person except after notice to the Director on APPLICATION TO TRANSFER PERMIT (EPA Form 7520-7) and in accordance with 40 CFR 144.38. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed in 40 CFR 2.203 and on the application form or instructions, or, in the case of other submissions, by stamping the words "confidential" or "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).

Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee.

2. Information which deals with the existence, absence, or level of contaminants in drinking water.

E. GENERAL DUTIES AND REQUIREMENTS

1. Duty to Comply

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application; except that the permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 CFR 144.34.

2. Penalties for Violations of Permit Conditions

Any person who violates a permit condition is subject to a civil penalty not to exceed $27,500 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine of not more than $27,500 per day of violation and/or being imprisoned for not more than three (3) years.

3. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. To be timely, a complete application for a new permit must be received at least 180 days before this permit expires.

4. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

5. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

6. Proper Operation and Maintenance

The permittee shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

7. Duty to Provide Information

The permittee shall provide to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also provide to the Director, upon request, copies of records required to be kept by this permit.

8. Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by SDWA, any contaminants or parameters at any location.

9. Records

a. The permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete this permit application for a period of at least three years from the date of the sample, measurement, report or application. These periods may be extended by request of the Director at any time.

b. The permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of plugging and abandonment. At the conclusion of the retention period, if the Director so requests, the permittee shall deliver the records to the Director. The permittee shall continue to retain the records after the three year retention period unless he delivers the records to the Director or obtains written approval from the Director to discard the records.

c. Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The name(s) of the individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The name(s) of the individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

d. Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR 136.3 or in appendix III of 40 CFR Part 261 or in certain circumstances by other methods that have been approved by the Administrator.

e. All environmental measurements required by the permit, including, but not limited to measurements of pressure, temperature, mechanical integrity, and chemical analyses shall be done in accordance with EPA's Quality Assurance Program Plan.

f. As part of the COMPLETION REPORT, the operator must submit a PLAN that describes the procedures to be carried out to obtain detailed chemical and physical analysis of representative samples of the waste including the quality assurance procedures used including the following:

(1) The parameters for which the waste will be analyzed and the rationale for the selection of these parameters;

(2) The test methods that will be used to test for these parameters; and

(3) The sampling method that will be used to obtain a representative sample of the waste to be analyzed.

Where applicable, the Waste Analysis Plan (WAP) from the permit application may be incorporated by reference.

g. The permittee shall complete a written manifest for each load of waste received. The manifest shall contain a description of the nature and composition of all injected fluids, date of receipt, source of material received for disposal, name and address of the waste generator, a description of the monitoring performed and the results, a statement stating if the waste is exempt from regulation as hazardous waste as defined by 40 CFR 261.4, and any information on extraordinary occurrences.

For waste streams piped more or less continuously from the source(s) to the wellhead, the permittee shall provide for continuous, recorded measurement of the discharge volume and shall provide such sampling and testing as may be necessary to provide a description of the nature and composition of all injected fluids, and to support any statements that the waste is exempt from regulation as hazardous waste as defined by 40 CFR 261.4

h. Dates of most recent calibration or maintenance of gauges and meters used for

monitoring required by this permit shall be noted on the gauge or meter.

10. Reporting Requirements

The permittee shall give notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility or changes in type of injected fluid.

11. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

12. Twenty-Four Hour Reporting

a. The permittee shall report to the Director any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported orally within 24 hours:

(1) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water.

(2) Any noncompliance with a permit condition or malfunction of the injection system.

b. A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact date and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

13. Other Noncompliance

The permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition E-12.b.

14. Reporting Corrections

When the permittee becomes aware that he failed to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit such facts or information.

15. Signatory Requirements

a. All permit applications, reports required by this permit and other information requested by the Director shall be signed by a principal executive officer of at least the level of vice-president, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a principal executive of at least the level of vice-president.

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

(3) The written authorization is submitted to the Director.

b. If an authorization under paragraph a. of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph a. of this section must be submitted to the Director prior to or together with any reports, information or applications to be signed by an authorized representative.

c. Any person signing a document under paragraph a. of this section shall make the following certification:

"I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

F. PLUGGING AND ABANDONMENT

1. Notice of Plugging and Abandonment

The permittee shall notify the Director no later than 45 days before conversion or abandonment of the well.

2. Plugging and Abandonment Report

The permittee shall plug and abandon the well as provided in the PLUGGING AND ABANDONMENT PLAN (Appendix F), which is hereby incorporated as a part of this permit. Within 60 days after plugging any well the permittee shall submit a report to the Director in accordance with 40 CFR 144.51(p). EPA reserves the right to change the manner in which the well will be plugged if the well is not proven to be consistent with EPA requirements for construction and mechanical integrity. The Director may ask the permittee to update the estimated plugging cost periodically.

3. Cessation Limitation

After a cessation of operations of two years, the permittee shall plug and abandon the well in accordance with the plan unless he:

a. Provides notice to the Director;

b. Demonstrates that the well will be used in the future; or

c. Describes actions or procedures, satisfactory to the Director, that the permittee will take to ensure that the well will not endanger underground sources of drinking water during the period of temporary abandonment. These actions and procedures shall include compliance with the technical requirements applicable to active injection wells unless waived by the Director.

4. Cost Estimate for Plugging and Abandonment

a. The permittee estimates the 1997 cost of plugging and abandonment of the permitted wells to be $1,000,000 each

b. The permittee must submit financial assurance and a revised estimate in April of each year. The estimate shall be made in accord with 40 CFR 144.62.

c. The permittee must keep at the facility during the operating life of the facility the latest plugging and abandonment cost estimate.

d. When the cost estimate changes, the documentation submitted under 40 CFR 144.63(f) shall be amended as well to ensure that appropriate financial assurance for plugging and abandonment is maintained continuously.

e. The permittee must notify the Director by registered mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding.

G. FINANCIAL RESPONSIBILITY

The permittee shall maintain continuous compliance with the requirement to maintain financial responsibility and resources to close, plug, and abandon the underground injection well. If the financial test and corporate guarantee provided under 40 CFR 144.63(f) should change, the permittee shall immediately notify the Director. The permittee shall not substitute an alternative demonstration of financial responsibility for that which the Director has approved, unless it has previously submitted evidence of that alternative demonstration to the Director and the Director notifies him that the alternative demonstration of financial responsibility is acceptable.

PART II
WELL SPECIFIC CONDITIONS

A. CONSTRUCTION

1. Casing, Cementing and Logging

The permittee shall case and cement the well(s) to prevent the movement of fluids into strata other than the authorized injection interval (see II.C.3, below). Casing and cement shall be installed in accordance with application Appendix F. The permittee shall, at a minimum, run the open- and cased-hole logs as described in application Appendix F.

The permittee shall provide not less than ten days advance notice to the Director of all cementing operations.

2. Tubing and Packer Specifications

The well shall inject fluids through tubing with a packer. Tubing and packer shall be installed in accordance with Appendix F of the permit application. Except as may otherwise be authorized herein, the packer shall be located not more than 150 feet uphole from the top of the authorized injection zone.

With respect to WD-2 completed in April 1999 with the packer as installed at approximately 7865 feet TVD, operation with the packer located at this depth is authorized provided enhanced surveillance continues to demonstrate integrity of the pipe below the packer. See Part II.C.3.(b)(3)

3. New Wells in the Area of Review

New wells within the area of review shall be constructed in accordance with the Alaska Oil and Gas Conservation Commission Regulations Title 20 - Chapter 25. Further, no offsetting wells within the Area of Review (1/4 mile radius) may be drilled into or below the arresting zone (lower Kingak Formation) as depicted in Exhibit C-2 of the application) unless directed by EPA..

B. CORRECTIVE ACTION

The applicant has identified no wells in the Area of Review (AOR) which require corrective action in order to prevent fluids resulting from injection from moving above the confining zone. If the applicant later discovers that a well or wells within the AOR require(s) corrective action to prevent this fluid movement, as described in 40 CFR 144.55, then the applicant shall inform the EPA upon such discovery and provide a corrective action plan for EPA review and approval. If the EPA or the applicant discovers that fluids resulting from injection have moved above the confining zone along the wellbore of a well within the Area of Review, then injection shall cease until the fluid movement problem can be diagnosed and corrected.

C. WELL OPERATION

1. Prior to Commencing Injection

Injection operations pursuant to this permit may not commence until:

a. Construction is complete and the permittee has submitted two copies of COMPLETION FORM FOR INJECTION WELLS (EPA Form 7520-9), see APPENDIX; and

(1) The Director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or

(2) The permittee has not received notice from the Director of intent to inspect or otherwise review the new injection well within thirteen (13) days of receiving the COMPLETION REPORT in which case prior inspection or review is waived and the permittee may commence injection.

b. The operator demonstrates that the well has mechanical integrity as described herein and in Part II.C.3 below and the permittee has received notice from the Director that such a demonstration is satisfactory. The permittee shall notify EPA two weeks prior to conducting this initial test so that an EPA representative may be present.

In order to demonstrate there is no significant leak in the casing, tubing or packer, the tubing/casing annulus must be pressure tested to at least 3,500 pounds per square inch gauge (psig) for not less than thirty minutes. Pressure shall show a stabilzing tendency. That is, the pressure may not decline more than 10 percent during the test period and shall experience less than one-third of its total loss in the last half of the test period. If the total loss exceeds 5% or if the loss during the second 15 minute period is equal to or greater than one half the loss during the first 15 minutes, the permitee may extend the test period for an additional 30 minutes to demonstrate stabilization..

c. The operator has conducted a step-rate test and submitted a preliminary report to EPA which summarizes the results.

2. During Injection

The injection facility shall be manned 24 hours per day by trained and qualified operators during injection.

3. Mechanical Integrity

a. Standards

The injection well(s) must have and maintain mechanical integrity pursuant to 40 CFR 146.8.

b. Prohibition Without Demonstration of Mechanical Integrity

Injection operations are prohibited after the effective date of this permit unless the permittee has conducted the following tests and submitted the results to the Director:

(1) To detect leaks in the casing, tubing, or packer, the casing-tubing annulus must be pressure tested to at least 3,500 psig for thirty minutes. Pressure shall show a stabilzing tendency as described in II.C.1.b, above. This pressure test is required at a time interval of no more than 12 months between tests.

(2) To detect movement of fluids behind the casing, approved fluid movement tests shall be conducted not less often than annually. Approvable fluid movement tests include, but are not limited to tracer surveys, temperature, noise or other logs. The specific suite of fluid movement tests proposed to satisfy this requirement are subject to prior approval by the Director. Tracer surveys shall be run at injection pressures at least equal to the maximum continuous injection pressure observed in the well in the previous 6 months and the tracer concentration shall be sufficient to ensure detection behind the casing. Copies of all logs shall be accompanied by a descriptive and interpretative report. The initial operational fluid movement tests shall be completed not less than three nor more than nine months after initiation of operation. In the event these initial tests are held after less than six months of operation, tracer surveys shall be run at injection pressures at least equal to the maximum continuous injection pressure observed in the well since the beginning of operation.

(3) Continued operation of Alpine WD-02 as originally constructed is dependent upon implementation by the permittee of the Enhanced Surveillance Plan (ESP) attached to this permit as Appendix B and incorporated herein by reference. In the event the EPA approves relocation of the packer and the permittee completes the packer relocation, the permittee may cease implementation of the ESP.

c. Terms and Reporting

(1) Two (2) copies of the log(s) and two (2) copies of a descriptive and interpretive report of the mechanical integrity tests identified in 3.b shall be submitted within 45 days of completion of the logging.

(2) Mechanical integrity shall also be demonstrated by the pressure test in 3.b.(1) any time the tubing is removed from the well or if a loss of mechanical integrity becomes evident during operation. The permittee shall report the results of such tests within 45 days of completion of the tests.

(3) After the initial mechanical integrity demonstration, the permittee shall notify the Director of intent to demonstrate mechanical integrity at least 30 days prior to subsequent demonstrations. Such notice must include an indication of the suite of fluid movement tests the permittee proposes to use. In the event that any of the proposed tests has not been previously approved by the Director, this notice shall include: (a) a complete description of such proposed tests, (b) available evidence supporting the applicability of the proposed test, and (c) a description of such back-up procedures as the permittee deems necessary to adequately demonstrate mechanical integrity in the event that the proposed tests fail to do so.

(4) The Director will notify the permittee of the acceptability of the mechanical integrity demonstration within 13 days of receipt of the results of the mechanical integrity tests. Injection operations may continue during this 13 day review period. If the Director does not respond within 13 days, injection may continue.

(5) In the event that the well fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity occurs during operation, the permittee shall halt operation immediately and shall not resume operation until the Director gives approval to resume injection.

(6) The Director may, by written notice, require the permittee to demonstrate mechanical integrity at any time.

4. Injection Intervals

Injection shall be limited to the Ivishak and Sag River Formations, as depicted in Exhibits C-1 and C-2 of the application.

5. Injection Pressure and Rate Limitations

The maximum injection pressure, measured at the wellhead, shall not exceed 3200 pounds per square inch (psig). Further, injection pressures and rates shall be limited as needed to prevent the initiation of new fractures or propagation of existing fractures in the upper confining zone (above the J3 marker which separates the upper and lower Kingak Formations) depicted in Exhibit C-2 of the permit application. The permittee shall continuously monitor both the injection rate and pressure.

7. Annulus Pressure

The annulus between the tubing and the long string casing shall be filled with a corrosion inhibited non-freezing solution. A positive surface pressure up to 1500 psig is authorized.

8. Injection Fluid Limitation

No substance other than those non-hazardous wastes noted in the permit application shall be injected. Neither hazardous waste as defined in 40 CFR 261 nor radioactive waste other than naturally occurring radioactive material (NORM) from pipe scale and sludge shall be injected for disposal.

D. MONITORING

1. Monitoring Requirements

Samples and measurements collected for the purpose of monitoring shall be representative of the monitored activity.

2. Continuous Monitoring Devices

Continuous monitoring devices shall be installed, maintained, and used to monitor injection pressure and rate, and to monitor the pressure of the non-freezing fluid in the annulus between the tubing and the long string casing. Calculated flow rates and calculated volumes are not acceptable.

3. Alarms and Operational Modifications

a. The permittee shall install, continuously operate, and maintain alarms to detect excess injection pressures and rates and significant changes in annular fluid pressure. These alarms must be of sufficient placement and urgency to alert operators in all operating spaces.

b. The permittee shall install and maintain an emergency shutdown system to respond to losses of internal mechanical integrity as evidenced by deviations in the annular fluid pressure.

c. Plans and specifications for the alarms and pressure relief valve shall be submitted to the Director prior to the initiation of injection.

E. REPORTING REQUIREMENTS

1. Quarterly Reports

The permittee shall submit quarterly reports to the Director containing the following information:

a. Monthly average, maximum and minimum values for injection pressure, rate, and volume shall be reported on INJECTION WELL MONITORING REPORT (EPA Form 7520-8).

b. Graphical plots of continuous injection pressure and rate monitoring.

c. Raw monitoring data in an electronic format.

d. Physical, chemical, and other relevant characteristics of the injected fluid.

e. Any well work over or other significant maintenance of downhole or injection-related surface components.

f. Results of all mechanical integrity tests performed since the previous report including any maintenance-related tests and any “practice” tests.

g. Any other tests required by the Director.

2. Report Certification

All reporting and notification required by this permit shall be signed and certified in accordance with Part I.E.15., and submitted to the following address:

Manager, Ground Water Protection Unit
U.S. Environmental Protection Agency (OW-137)
1200 Sixth Avenue
Seattle, Washington 98101

APPENDIX A

REPORTING FORMS

Enclosed are EPA Forms:

7520-7	APPLICATION TO TRANSFER PERMIT
7520-8	INJECTION WELL MONITORING REPORT
7520-9	COMPLETION FORM FOR INJECTION WELLS

APPENDIX B

Enhanced Surveillance Plan

1. This Enhanced Surveillance Plan (Plan) is required pursuant to Part II.A.C.3.b.3 of the Permit Number AK-1I003-A. This Enhanced Surveillance Plan was developed to address EPA's concerns about continued casing integrity with respect to the current packer placement in this well.

2. All demonstrations of mechanical integrity described in Permit AK-1I003-A, Part II.A.C.3.b remain in full force and effect. To summarize, this includes the following;
   - Standard casing-annulus pressure tests (SAPT) to detect loss of mechanical integrity above the packer.
   - Fluid movement tests to detect fluid movements behind the casing and loss of mechanical integrity below the packer. Approved tests include, but are not limited to tracer surveys, temperature surveys, noise or other logs as approved by the EPA.

3. To non-destructively evaluate casing condition below the packer, caliper surveys shall be conducted not less often than annually over all exposed 7" casing between the tubing tail and the injection interval.

4. To confirm the results of the annual caliper and tracer surveys, pressure testing of all exposed 7" casing between the packer and the top of the permitted injection interval will be performed not less often than every 4 years with the first pressure test to be performed in 2003. Isolation plugs will be set in the 7" casing within 100 feet of the permitted injection interval and tested through the tubing to a surface pressure of 3500 psig for 30 minutes. Testing specifications will duplicate those specified in Permit 1I003-A Part II.C.1.b.

5. In the event that (1) surveillance determines casing wall losses exceed 50% of the casing wall thickness in any area of exposed casing between the bottom of the packer tailpipe and the approved injection interval or (2) for other reasons, EPA or permittee believe the casing integrity may be compromised, surveillance logs and other information shall be reviewed by EPA and permittee to determine if additional surveillance or remedial activities are necessary.

6. Modification to this Enhanced Surveillance Plan must be approved by EPA.

7. This Enhanced Surveillance Plan remains in effect until such time as the Plan is modified, or the permit condition requiring said Plan is eliminated.